



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

17 OCT 2005

Mr. Robert Geller, Director
Hazardous Waste Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Dear Mr. Geller:

First I would like to thank you and Mr. Schuette for meeting with us on October 5th to discuss the Environmental Protection Agency's (EPA's) concerns with certain aspects of the Missouri Risk Based Corrective Action (MRBCA) technical guidance document.

The following summarizes our understanding of the subject areas that will need to be further refined in the technical guidance:

1. The EPA has concerns with the MRBCA's approach for calculating exposure point concentrations. Specifically, if sufficient site characterization is not conducted and all data points are utilized in the calculations, the resulting exposure point concentration could lead to lack of action at a site due to averaging of all sample results. As we discussed, specific language in either the Memorandum of Agreement (MOA) with EPA or in the technical guidance addressing this situation would address this concern.
2. We believe that the MRBCA screening values and strict reliance on modeling and soil vapor sampling may lead to overlooking site risks associated with inhalation of vapors arising from contaminated groundwater. We have experience at sites where levels of contaminants below MRBCA's groundwater screening levels have in fact impacted indoor air at homes. As discussed, the inclusion of subsurface slab monitoring in certain cases (e.g., shallow groundwater and high volatiles concentrations) would address these concerns. We look forward to working with you on better defining the site conditions when subsurface slab monitoring would be required as a confirmatory measure. Enclosed are examples that more clearly depict these concerns.

Although the EPA's Risk Assessment Guidance and the State's MRBCA guidance differ in their methodologies, we believe that exclusion of certain high priority



sites and sites from the MOA (e.g., proposed or listed NPL sites, and potentially RCRA High Priority sites etc.) would address situations where the application of MRBCA would differ significantly from the EPA's risk assessment process. In addition, please note that Federal properties on the Federal Agency Hazardous Waste Compliance Docket would still require federal approval to be removed from the docket.

The EPA is committed to conducting the MOA negotiations as quickly as possible. Since we are required to obtain EPA Headquarters' concurrence on the MOA, we are currently in the process of coordinating with the appropriate Headquarters offices regarding our comments to the draft MOA that MDNR provided to EPA on September 16. Due to the January 11, 2002 Brownfields law, requirements for evaluation of State Voluntary Cleanup Programs (VCPs) has changed somewhat. For MDNR, these changes entail additional requirements for timely survey and inventory of Brownfield sites and maintenance of a public record of VCP sites. To incorporate these changes, EPA will be using the format of the Iowa MOA that was signed last year. Regarding RCRA sites, we are working with our Headquarters on language in the MOA discussing the use of MRBCA at RCRA corrective action facilities. EPA Headquarters has raised preliminary concerns with the types of RCRA facilities covered by the proposed MOA. Similar issues have arisen in Florida, Louisiana, Nebraska, and Wisconsin. We will relay Headquarters' comments as soon as they are available to us.

We look forward to working on these few remaining concerns and finalizing the MOA. If you have any comments or questions on these topics, please contact Craig Smith at (913) 551-7683 or me at (913) 551-7733.

Sincerely,

A handwritten signature in dark ink, appearing to read "Cecilia Tapia", is written over a circular stamp or seal.

Cecilia Tapia
Director
Superfund Division

Enclosures

cc: Gayle Carlson, MDHSS

Enclosure
Expanded Explanation of Risk-Related Issues

MDNR and USEPA have reached agreement on a tremendous number of risk-related issues over the last several months. From our perspective only four issues remain. Three of the four are directly related to the adequacy of public health protection. The fourth is a rather simple issue dealing with transparency in the process. Since technical resolution was unable to be reached we believe that some additional information might better illustrate why we continue to feel strongly about these remaining issues from a public health perspective. Necessarily the following clarifications and examples are not technical in nature; rather they over-simplify the remaining issues in order to more clearly explain our concerns. We acknowledge this and have included what we believe the typical range of differences between our respective approaches is likely to be based on analysis existing site data.

1) Exposure Point Concentration

- We are concerned that the MRBCA guidance's approach for calculating an exposure point concentration has a significant probability of underestimating risks. The statistics in comparing the approaches tend to require quite a bit of discussion and background, however the following example provides a clear sense of why we continue to be concerned.

Example – Differences in Exposure Point Concentrations

- Assume a site where an exposure domain has been identified as per the MRBCA guidance, where 16 samples were collected (see Figure 1) in a biased manner in a defined area where contamination was known, or expected to be found.
 - Use of the MRBCA approach, where the exposure point concentration equals the arithmetic average of the sample values, yields an exposure point concentration of 323 ppm.
 - Using the USEPA approach (the 95% UCL which ensures with 95% confidence that the mean is at or below the calculated value) yields an exposure point concentration of 3,426 ppm.
- We stress that this is an oversimplification with a simplified set of data. However it demonstrates that there can be up to a 10-fold difference in exposure point concentrations.
- We have recently evaluated several real-world data sets using both approaches and found 2 to 4-fold differences. We would expect this to be the case with most sites, with only a minor number approaching a 10-fold difference.
- **Conclusion:** We believe there is a high probability of underestimating risk which accordingly may yield an inadequate level of public health protection especially at those sites where cumulative site-wide risk using the MRBCA approach is calculated to be near 1 in 10,000.

2) Exposure Variables

- In some instances, we believe MDNR uses values inconsistent with those deemed necessary in developing a reasonable maximum exposure (RME) scenario that is considered protective of public health.
 - The construction worker soil ingestion rate is 3.3-fold less than USEPA's default value.
 - Daily inhalation rates are 1.3-fold to 4-fold less than those used by USEPA.
 - It is still unclear whether all dermal exposure variables are consistent with USEPA values.

Example – Cancer Risk to Construction Worker

- **Soil Ingestion Rate:** This example illustrates the potential impact on the estimated cancer risk using the MRBCA soil ingestion rate as compared to USEPA's value. It assumes all other input parameters are the same.
 - MRBCA Risk Estimate = 1 in 100,000
 - USEPA Risk Estimate = 3.3 in 100,000
- **Arithmetic Average vs. 95% UCL:** The second part of this example assumes that there is also a 10-fold difference in using an arithmetic average as compared to a 95% upper confidence limit in estimating an exposure point concentration.
 - MRBCA Risk Assessment = 1 in 100,000
 - USEPA = 3.3 in 10,000 (1 in \approx 3,000)
- Our experience in calculating EPCs is that the arithmetic mean is often 2-fold to 4-fold less than the 95% UCL.
- For the construction worker, a 4-fold difference in EPC estimates would result in a situation where USEPA would take an action because the cancer risk is greater than 1 in 10,000 and MDNR would not do so because the risk does not exceed 1 in 100,000 for an individual contaminant.
- **Conclusion:** This example demonstrates that MRBCA may fail to take action when warranted to protect public health.

3) Vapor Intrusion

- We believe that the MRBCA screening values and reliance on modeling and soil vapor sampling as opposed to use of USEPA's draft Vapor Intrusion Guidance will result in false negatives. Consequently sites where vapor intrusion may be impacting indoor air may not be adequately evaluated.
- MRBCA's Tier 1 groundwater risk-based screening levels for indoor inhalation of vapor emissions are significantly higher than screening levels provided in USEPA's vapor intrusion guidance (see two examples below).

<u>Compound</u>	<u>MRBCA</u>	<u>EPA</u>
Trichloroethylene	1600 ppb	5 ppb
Perchloroethylene	709 ppb	5 ppb

- USEPA has experience at sites in the Region where levels of contaminants below MRBCA's groundwater screening levels have in fact impacted indoor air at homes. Use of the MRBCA approach would have resulted in screening out indoor air instances where actual contamination was entering residences.
- MRBCA relies heavily on soil vapor sampling and modeling rather than indoor air sampling. USEPA has experience at several sites where soil vapor sampling and modeling have yielded false negatives. In other words results from soil vapor sampling and modeling have shown no problem while indoor air sampling has verified there is a problem.
- **Conclusion:** Our experience with several sites in the Region is that the use of the MRBCA approach would result in mischaracterization of the risk due to the vapor intrusion and the potential for inadequate public health protection.

4) More Accurate Portrayal of Cumulative Risks

- We believe that the MRBCA approach should include a cumulative site-wide risk value (simply the sum of all risks associated with all exposure pathways and contaminants), as EPA currently requires.
- As written, MRBCA only requires this if the sum of pathways and contaminants exceeds 10 (since no single risk can exceed 1 in 100,000, which could not result in a sum that exceeds 1 in 10,000).
- Since such a calculation only involves a simple summation that can be completed in seconds with pen and paper, we feel that the public is better served by risk-based process that is as transparent as possible. Additionally, project managers are better served knowing actual cumulative risk rather than only knowing that cumulative risk is less than 1 in 10,000.
- **Conclusion:** *MRBCA does not provide the most transparent portrayal of risk to decision makers or the public at sites.*

Figure 1.
Values in ppm

